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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,137	.09/04/2001	Nobuyuki Matsumoto	35.C15739	1747

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EXAMINER

NGUYEN, LAM S

ART UNIT PAPER NUMBER

2853

DATE MAILED: 11/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/944,137

Applicant(s)

MATSUMOTO ET AL.

Examiner

LAM S NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 29 September 2003 and 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,8 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

The substitute specification filed on 10/28/2003 has been considered and entered. No new issues was introduced.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imanaka et al. (EP 0920999) in view of Okada et al. (US 5886713).

Imanaka discloses a liquid discharge apparatus comprising:

- a discharge port for discharging liquid (FIG. 1, element 5);
- a liquid flow path (FIG. 1, element 7) communicating with said discharge port having a bubble generating region for generating a bubble (FIG. 1: the region is above element 2);
- a discharge energy generating element (FIG. 1, element 2) for generating thermal energy for generating the bubble in the liquid inside said bubble generating region; and
- a movable member (FIG. 1, element 6) facing said discharge energy generating element spaced apart from said discharge energy generating element, an end portion of said movable member situated at an upstream side in the flow direction of the liquid inside said liquid flow path is fixed and a down stream end thereof is a free end, in which ink is

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discharged from said liquid discharge head and a recording is performed by adhering said liquid on a medium to be recorded, wherein said liquid discharge apparatus comprises:

a temperature sensor for detecting a temperature inside the liquid flow path (column 3, line 13-16 and column 4, line 12-19: a temperature sensor is provided in the second substrate that constitutes a plurality of liquid flow paths); and

means for controlling or stopping the driving to said discharge energy generating element when a judgment is made that the ink is not supplied normally based on the detection result of the ink supply state inside said liquid flow path (column 4, line 12-19: based on a detected temperature detected indicating the presence or absence of the ink, the driving of the heat generating resistor can be limited or stopped).

Imanaka et al. (EP 0920999) do not disclose a predetermined period at which said temperature sensor detects the temperature inside said liquid flow path and said means for controlling or stopping the driving of said discharge energy generating element by judging that the liquid is not normally supplied being based on a temperature rise per period detected by said temperature sensor.

Okada et al. disclose a printhead comprising of a temperature sensor for periodically detecting, at a predetermined period, a temperature inside said liquid flow path (column 5, line 15-18) and means for controlling or stopping the driving of said discharge energy generating element by judging that the liquid is not normally supplied based on a temperature rise per period detected by said temperature sensor (FIG. 8 and column 5, line 10-19) to prevent the ink discharge failure without affecting speed of the printing operation of the printing apparatus (column 6, line 30-37).

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Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to include a condition for terminating printing operation when the detected temperature indicating the state of the ink supply is greater than a threshold value as disclosed by Okada et al. into the liquid ejecting head disclosed by Imanaka (EP 0920999) in view of Imanaka et al. (US 5992984). The reason of doing so is that it is possible to control printing in order to prevent the ink discharge failure without affecting speed of the printing operation of the printing apparatus as taught by Okada et al. (column 6, line 30-37).

Imanaka et al. also disclose the limitation in the following claims:

Referring to claim 3: further comprising driving signal supply means (Fig. 4) for supplying a driving signal for allowing the liquid to eject from said liquid discharge head.

Referring to claim 4: further comprising a conveyance means for conveying the medium to be recorded which receives the liquid discharged from said liquid discharge head (FIG. 17, element 161).

2. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imanaka et al. (EP 0920999) in view of Okada et al. (US 5886713) as applied to claims 1 and 5, further in view of Ohshima et al. (EP 0569201 A1).

Imanaka et al., as modified, disclose the claimed invention as discussed above and wherein said means for controlling or stopping the driving of said discharge energy generating element judges that the liquid is not supplied normally based on the temperature rise per period inside said liquid flow path detected by said temperature sensor. However, Imanaka et al., as modified, do not disclose wherein controlling or stopping the driving of said discharge energy generating element is also based on printing data.

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Oshima et al. disclose a method for detecting the abnormality of ink discharged based on printing data, representing by energy applied to discharge heater, and the temperature change of ink (FIG. 11-13) in order to obtain a high precise detection of the ink discharge state (column 3, line 10-13).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the process for controlling or stopping the driving of said discharge energy generating element based on the temperature rise per period detected by the temperature sensor as disclosed by Imanaka et al., as modified, such that the process is also based on printing data as disclosed by Oshima et al. The motivation of doing so is to provide an ink jet recording apparatus capable of high precise detecting the temperature characteristics as taught by Oshima et al. (column 3, line 6-13).

Response to Arguments

Applicant's arguments filed 09/29/2003 have been fully considered but they are not persuasive.

Regarding to the argument on page 7 referring to claims 1 and 5: The applicants argued that Okada fails to teach or suggest judging that liquid is not supplied normally based on a temperature rise per period detected by the temperature sensor. However, as discussed above, Okada discloses the above limitation. Therefore, the argument is not persuasive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (703)305-3342. The examiner can normally be reached on 7:00AM - 3:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (703)308-4896. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9306 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LN

November 7, 2003

Hai Li Pham
HAI PHAM
PRIMARY EXAMINER